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Equilibrium solutions of MHD equations for GAMs in the edge tokamak plasma

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Numerical calculations of nonlinear MHD equations in frames of reduced two-fluid Braginskij equations for geodesic acoustic modes (GAM) with n = 0, m = 0, +1, -1 in high collisional edge tokamak plasma were performed. N = 0, m = 0, +1, -1. It was shown that with account of parallel dissipation (finite conductivity sigma//) allows us to obtain the steady state equilibrium solutions for GAMs. The obtained 2D equilibrium includes the velocity of poloidal rotation and the equilibrium electric potential, which value is close to well-known Pfirsh-Schluter potential. It was shown that the main role in formation of the equilibrium poloidal rotation plays two forces: the Stringer-Winsor force and the neoclassical force, linked with the parallel viscosity. Maximum values of GAM are located near the maximum of pressure gradient. Calculated radial profile of electric field E looks like the parabolic negative well (E < 0).

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